



3D Crustal Analysis of the North-Ligurian Margin from Refraction Tomography and Microseismic Monitoring

Soazig Simon (1), Jean-Xavier Dessa (1), Marie-Odile Beslier (1), Anne Deschamps (1), Nicole Béthoux (1), Stefano Solarino (2), Elena Eva (2), Françoise Sage (1), Gabriele Ferretti (3), and Claudio Eva (3)

(1) France (ssimon@geoazur.obs-vlfr.fr), (2) INGV/Dip.Te.Ris, Genova, Italia, (3) Univ. Genova/Dip.Te.Ris, Genova, Italia

The GROSMarIn experiment investigates the structures of the seismically active North Ligurian rifted margin. An array of 21 Ocean Bottom Seismometers was deployed offshore a region spanning from Nice to Imperia and recorded seismic refraction shots as well as microseismicity for a duration of more than 5 months. This marine array was extended onland by both the regional French and Italian seismic networks and 13 mobile stations that provided an even density of wavefield sampling on- and offshore. With this programme, we aim at characterizing the main structures of this singular margin and adjacent atypical oceanic domain and thick Alpine foreland. We also seek to detect and locate microseismic events that occur regularly, significantly offshore, and that herald rare large events such as the destructive 1887 Imperia earthquake (Mw 6.5) which is the greatest one to have occurred in the area since at least four hundred years, and whose source and associated tectonics remain poorly understood. We present and discuss results of our active first arrival travel time tomography that accurately covers the margin and coastal zone and includes a total of \sim 178,000 picks. The transition from oceanic to continental domains is clearly evidenced as well as an intermediate zone wherein we have hints of anomalously high basal crust velocities, already evidenced on other non volcanic rifted margins and most likely related to rifting and continental breakup processes. Velocity structures are not found to exhibit significant variations along strike and locally fit some published results of 1D ESP logs. Tests have been performed to assess the resolution of our tomography as well as the robustness of the solution. Ongoing works to detect and characterise microseismic events that occurred during the experiment – as compared to those events detected by the sole land permanent networks – will also be presented.